



The Interstate Technical Group on Abandoned Underground Mines (ITGAUM) Past, Present, and Future

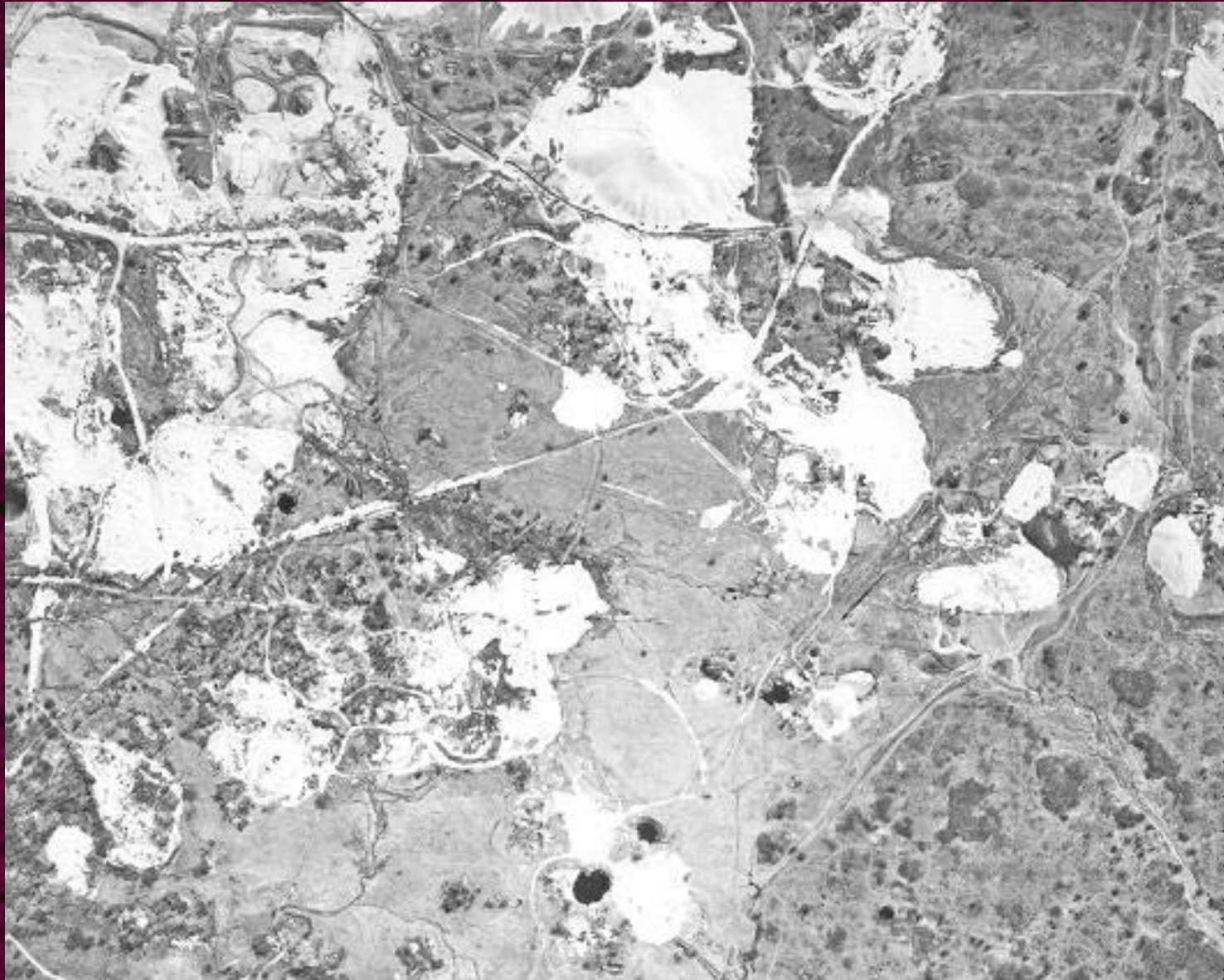
Thomas Lefchik, P.E.
Ohio DOT
Retired FHWA



Effect of Mining on Transportation Systems



Collapse of old workings
Norwich 1988









Interstate Technical Group on Abandoned Underground Mines

- A group of technically oriented individuals responsible for the remediation of underground mines beneath transportation facilities.



I-70 Ohio March 5, 1995
“Sinkholes don’t have a conscience.” Bruce Beechie

Goals

- Generate and disseminate information.
- Obtain outside funding or cooperatively share in the costs of research or other mutually beneficial efforts.

CURRENT MEMBERS

- Alabama
- Arizona
- Federal Highway Administration
- Federal Railroad Administration
- Illinois
- Indiana
- Iowa
- Kansas
- Kentucky
- Maryland
- Michigan
- Minnesota
- Missouri
- Natural Resources Canada
- Nevada
- New Jersey
- New York
- North Dakota
- Ohio
- Ontario, Canada
- Pennsylvania
- Pennsylvania Turnpike
- Virginia

Workshops

- 1997 Columbus, Ohio
- 1998 Saint Louis, Missouri
- 2000 Kansas City, Kansas
- 2002 Davenport, Iowa
- 2004 Tucson, Arizona
- 2006 Rochester, New York
- 2008 Kansas City, Missouri
- 2011 Webinar (Spring)
- 2011 Webinar (Fall)
- 2013 Harrisonburg, Virginia

Types of Mines

- Hard Rock – gold, silver, lead, zinc, iron, hard minerals, etc.
- Soft Rock – coal, clay, salt, gypsum, limestone, etc.

There are similarities and unique differences in them all.

Mine Problems

- Subsidence
- Slope Instability
- Flooded Mines in Slopes
- Acid Drainage
- Waste
- Fire
- Endangered species habitat

Types of Issues Discussed

- Inventory
- Investigation
- Modeling
- Assessment
- Monitoring
- Remediation

MANUAL FOR

ABANDONED UNDERGROUND MINE INVENTORY AND RISK ASSESSMENT



MAY 15, 1998
The State of Ohio is an
Equal Opportunity Employer

ITGAUM
INTERSTATE TECHNICAL GROUP ON
ABANDONED UNDERGROUND MINES

National Mine Map Repository

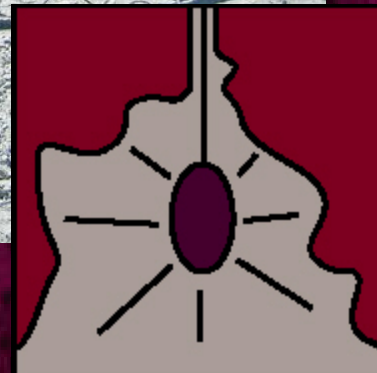
- Office of Surface Mining Reclamation and Enforcement
- More than 140,000 maps

Imaging

- Success!
- LIDAR, Sonar, Video

Cavity Auto Laser Scanner

- provide 3D imagine







Geophysics Success

- No magic black box
- Members became more knowledgeable
- Vendors developed techniques and expertise
- 3D crosshole seismic
- REMI
- Reverse seismic
- Crude methods – FWD and profilometer

3D Seismic

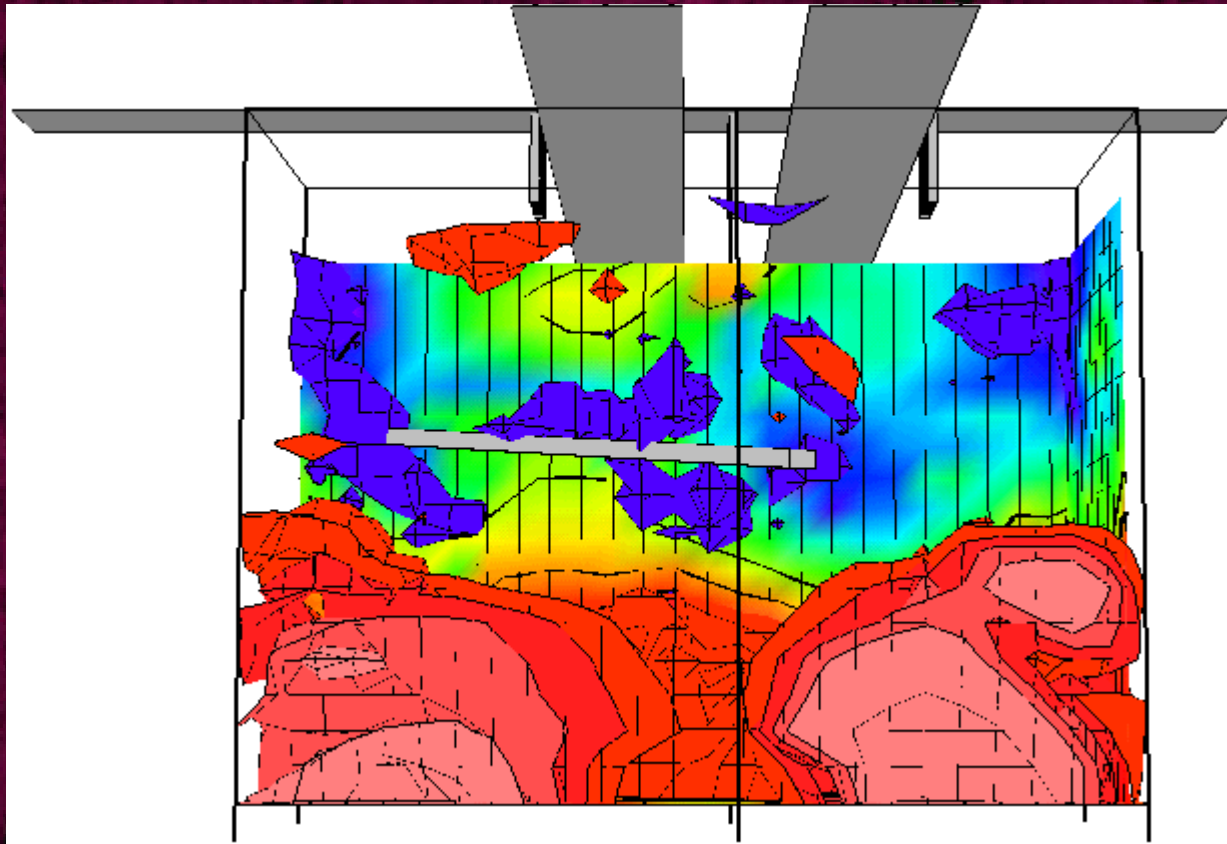
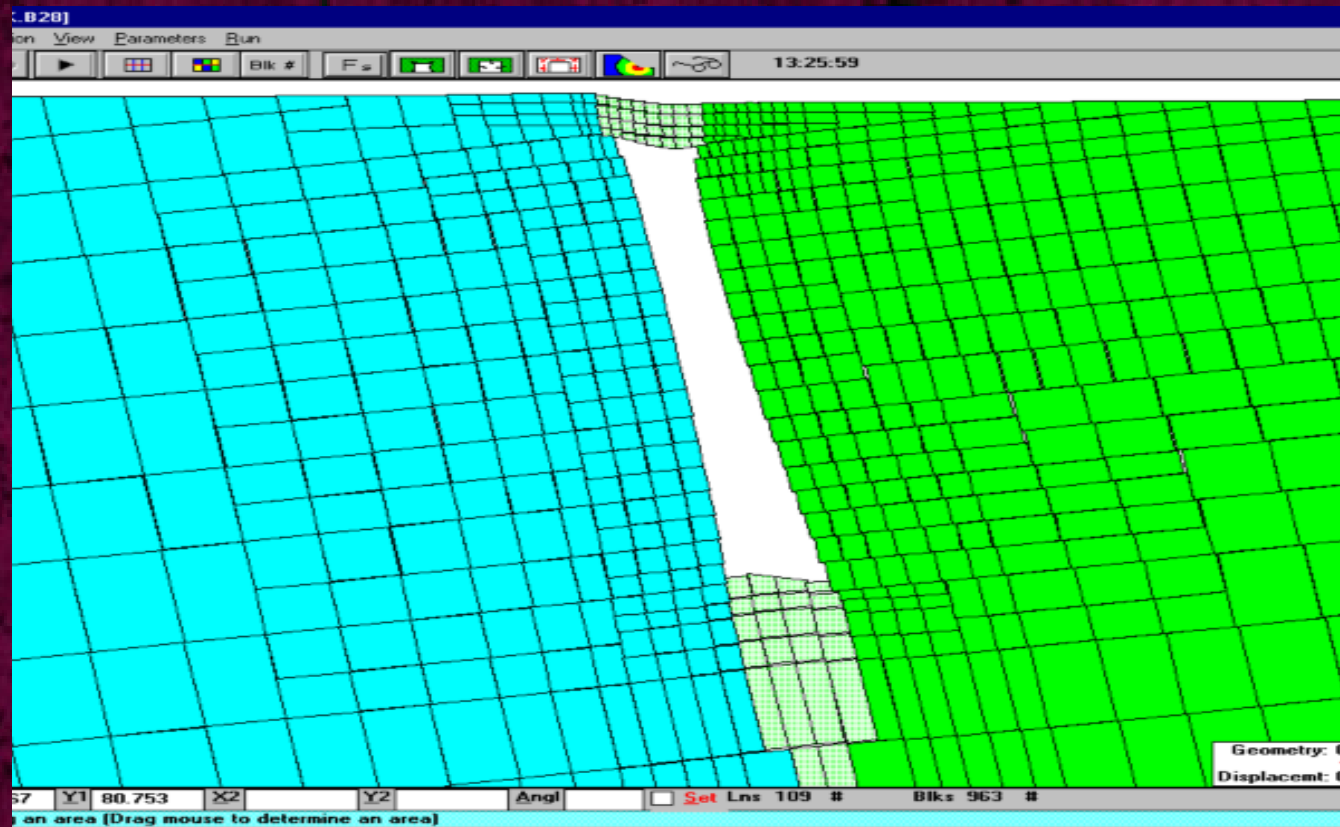


Figure 1. 3-D tomographic image showing tunnel location and selected velocity contours.

Numerical Modeling

Simulation of material behavior under imposed conditions using computational techniques (equation solving).



Horizontal Time Domain Reflectometry (TDR)



Remediation Methods

- Grout or aggregate fill
- Excavate and backfill
- Implosion
- Backstow
- Various capping methods
- Bridging
- Accommodate movement
- Assess risk and monitor
- And more

Surprise Issues

- What happens when you bore into a water filled mine?



Surprise Issues

- What happens when you fill a water filled coal mine with grout?



Transportation Research Board

- Symposium 2001
- Subcommittee formed 2002
- TRB Session 2004
- Disbanded 2008

Success!

- Proactive vs reactive
- Better planned investigations
- More thorough risk assessment
- Knowledge of where to go for historical and technical information
- Better knowledge of investigation techniques
- Understanding of remediation techniques

Contacts

- ITGAUM members
- Academia
- Private sector – vendors and consultants
- Other state agencies
- Federal agencies (DOE, OSM, MSHA, FHWA, etc.)
- Other organizations - NAAML

More Work to be Done

- Continued development and implementation of geophysics
- Remote sensing
- Modeling
- Inventories not extensive
- Risk assessment versus other hazards
- Dissemination of best practice
- Improve cost of remediation

Future

- Continue workshops
- Best Practices Manual
- Cooperative research?

Web Site

www.fhwa.dot.gov/mine

Group information

Workshops and conferences

Resources

Mine Manual



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